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August 14, 1969

U. S. Government

Attention: Ray S.

Subject: Control No. 02228 - Status Report
for Period Ending July 31, 1969

Gentlemen:

During this report period the following tasks have been performed.

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1. Ed D. visited the [redacted] on July 1, and 2, 1969, to review progress on the twin stage comparator contract. He was joined by [redacted] a member of the customer's staff. Ed D. verbally notified the [redacted] during this visit that all future matters requiring the attention of the customer's technical representative should be directed to Ray S. Ed D. also made arrangements at this time for Ray S. to visit the [redacted] on July 10, so the [redacted] Stereo Comparator Head could be tested and its performance characteristics evaluated.

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2. Ray S. arrived at the [redacted] on July 10, as the customer's technical representative to test the [redacted] Stereo Comparator Head. After a series of tests the following performance characteristics for the unmodified Stereo Comparator Head were mutually agreed upon by the technical representative and the [redacted]

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- a. An image of a point in the object plane centered in the field of view remained well within a 2.0 mm diameter circle, centered in the eyepiece of the focal plane, when the image was rotated through 360°. This test made on both the left-hand and right-hand optical paths indicated that both pechan prisms were adjusted within specification.
 - b. The dot at the center of each reticle remained superimposed for all interpupillary distance settings as required by the specification.
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NGA Review Complete



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- c. At 200X magnification, axial resolution is 960 line pairs per millimeter. However, it was apparent that the right-hand portion of the stereo viewing system was optically superior to the left-hand side.

The resolution target utilized for this test was furnished by Ray S. and this same target will be used to check resolution of the Stereo Comparator Head after it has been modified and installed on the twin stage comparator.

3. The control panel used on the instrument console was discussed this report period with Ed D., [redacted] and Ray S. during their respective visits to the [redacted]. The following changes will be made to the control panel as a result of these discussions.

- a. The washer on the handle of the joystick will be reduced in diameter.
- b. Additional graduations will be added to the motor speed ratio selector control so an operator may more accurately record speed ratios used for specific film chips.
- c. Color coding will be employed on each stereo microscope objective lens and the diaphragm selector knob for the illumination system as a method of matching their numerical apertures. This match is necessary if proper illumination is to be realized for each of four different objective lenses.

The possibility of changing some of the wording used to identify the function of several knobs on the control panel has been discussed with the technical representative. For the most part these changes such as expanding the word DIAPHRAGM to DIAPHRAGM SELECTOR are not extensive, however, it would necessitate completely remaking the control panel to effect the changes. A scale mockup of the control panel complete with the knob identification was presented and discussed with three members of the customer's staff and a [redacted] on November 7, 1968. At that time no request was made to modify the wording used to identify the individual control knobs. Consequently, it was assumed that identical wording would be acceptable on the actual control panel. In view of these facts the [redacted] feels that it is not now obligated to make changes which would incur the expense of manufacturing a new control panel.

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4. The power supply and joystick control for the X and Y coordinate motor drive assemblies were completed. Both units are now ready for installation on the twin stage comparator.
5. Electrical limit switch assemblies were manufactured and installed on both X and Y coordinate motions. These switches are located so as to de-energize the drive motors before the stages reach their safe limits of travel. This protects the stage and precision lead screw assemblies from accidental damage should an operator inadvertently attempt to traverse the stages beyond their designed limits of travel.
6. The Digital Control System has been completed and will be tested and delivered during the next report period.
7. The electrical cabinet in which the Digital Control System will be mounted was received. The shelf and brackets for the writing surface are assembled and ready for installation on this cabinet.
8. Installed the wiring harness in the instrument console for all console mounted electrical components.
9. Finish lapping operations were completed on the ways for the X and Y coordinate stage motions.
10. A preliminary optical layout of the intended modification to the Stereo Comparator Head was drawn. When this proposed optical system was set up and checked on a lens bench it proved to be satisfactory. A design layout of the modified Stereo Comparator Head will be started during the next report period.

During the acceptance testing of the [redacted] Stereo Comparator Head the technical representative, Ray S., and [redacted] Company personnel all experienced difficulty in fusing the two reticles in the stereo viewing optics for longer than a few minutes at a time when viewing stereo film chips. Ray S. was made aware of the fact that the [redacted] has from the beginning been opposed to the use of two reticles in the stereo viewing optics. As technical representative, Ray S. agreed to review the need for dual reticles with the customer's staff and notify the [redacted] should a decision be made to remove one of the two reticles.

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It is estimated that approximately 73% of the work on the twin stage comparator contract has been completed as of this report period.

During the August report period the plans to do the following work.

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1. Review progress on the twin stage comparator contract with the Technical Representative.
2. Receive the digital control system and install it in the electrical cabinet.
3. Wire interconnections between the instrument console and electronic components mounted in the electrical cabinet.
4. Install writing shelf on the electrical cabinet.
5. Complete the design layout for the modification of the Stereo Comparator Head. As soon as the design of the casting utilized to mount the stereo viewing system on the instrument overarm is approved a pattern drawing will be completed. Every effort will be made to obtain this pattern during the August report period.
6. Detail drawings for the Stereo Head modification will be started and forwarded to the production department for manufacture as soon as they are completed.
7. Order all optical elements necessary to modify the Stereo Comparator Head.

A Status of Funds statement will be found on the following page.

Very truly yours,

Asst. Manager, Engineering

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